REMARKS

The Office Action of May 18, 2006, has been received and reviewed.

Claims 1-63 are currently pending in the above-referenced application. Of these, claims 1-25 have been considered and stand rejected. Claims 26-63 have been withdrawn from consideration.

Reconsideration of the above-referenced application is respectfully requested.

Rejections under 35 U.S.C. § 112, Second Paragraph

Claims 1-25 are rejected under the second paragraph of 35 U.S.C. § 112 for reciting subject matter that is allegedly unclear. Specifically, the recitation in independent claim 1 of a waveguide with a substrate that includes first planar surface and an opposite second surface that are "separated by a thickness and a surrounding edge" has been rejected.

This limitation has been removed from independent claim 1, broadening the scopes of independent claim 1 and claims 2-25, which depend directly or indirectly therefrom. As the allegedly unclear limitation has been removed from independent claim 1, it is respectfully submitted that independent claim 1, as amended and presented herein, is in condition for allowance, as are its dependent claims 2-25.

Withdrawal of the 35 U.S.C. § 112, second paragraph, rejections of claims 1-25 is respectfully requested, as is the allowance of each of these claims.

Rejections under 35 U.S.C. § 102

Claims 1–3, 5-7, 14-16, 19, and 21 have been rejected under 35 U.S.C. § 102(b) for being directed to subject matter that is purportedly anticipated by the subject matter described in U.S. Patent 5,132,095 to Attridge ("hereinafter "Attridge").

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Attridge describes an optical waveguide that includes a layer of solid transparent material 23 of refractive index n_2, that "act[s] as a waveguide." Col. 6, lines 17-21; FIG. 2(a). Fluorophores are bound to a surface 33 of the waveguide 23. Col. 7, lines 13-16. A *liquid sample* 21 of refractive index n_1 is placed on the layer of solid transparent material 23. Col. 6, lines 17-21; FIG. 2(a). Another layer 22 is located over the liquid sample 21. *Id.* Attridge does not provide any specifics on the refractive index or any other characteristics of layer 22, but does note that "the refractive index n_2 is greater than n_1." Col. 3, lines 33-35.

As fluorophores are apparently bound to the surface of the layer of solid transparent material (col. 6, lines 12-16), it appears that the waveguide 23 of Attridge would be most analogous to the waveguide film of independent claim 1. It is respectfully submitted that Attridge, however, lacks any express or inherent description of a substrate that meets the requirements of independent claim 1.

It is evident from the disclosure of Attridge that the liquid sample 21 (which has the lower refractive index n_1) is not a substrate of a composite waveguide, as the liquid sample 21 is not part of the waveguide.

Moreover, since the liquid sample 21 physically separates layer 22 from the waveguide 23, as illustrated in FIG. 2(a) of Attridge, it is apparent that the waveguide 23 is not "disposed on . . . [a] planar surface of" layer 22. In any event, it appears from FIG. 2(a) that the refractive index of layer 22 is less than refractive index n_1 of the liquid sample 21, which is less than the refractive index n_2 of waveguide 23. Thus, layer 22 is not the substrate of a composite waveguide.

Furthermore, Attridge lacks any express or inherent description of a waveguide film of relatively high refractive index "disposed on" the layer of solid transparent material 23, or waveguide, of the device disclosed therein, as well as any express or inherent description of capture molecules associated with such a waveguide film.

In addition to the optical waveguide, Attridge also describes an optical structure 24 that receives light from the waveguide 23. Col. 6, lines 21-26; FIG. 2(a). The optical structure 24 of Attridge includes a propagating layer 27 of refractive index n_3 (col. 6, lines 21-26), which is

sandwiched between layers 28 and 29 of refractive index n_4 (col. 6, lines 42-46). Refractive index "n_3 is greater than n_4." Col. 3, lines 33-35.

Like the optical waveguide of Attridge, the optical structure 24 of Attridge does not include each and every feature of the composite waveguide of the apparatus to which independent claim 1 is directed. For example, no capture molecules are associated with the propagating layer 27 of the optical structure 24, which, due to its higher refractive index n_3 than that (n_4) of layers 28 and 29, is more akin to the waveguide film of independent claim 1 than layers 28 and 29.

Therefore, it is respectfully submitted that neither the optical waveguide nor the optical structure 24 of Attridge anticipates each and every element of independent claim 1, as would be required to maintain the 35 U.S.C. § 102(b) rejection of independent claim 1.

Each of claims 2, 3, 5-7, 14-16, 19, and 21 is allowable, among other reasons, for depending directly or indirectly from independent claim 1, which is allowable.

Claim 2 is additionally allowable since Attridge lacks any express or inherent description of a light detection device positioned to detect light passing through a surface of a substrate of a composite waveguide. Rather, the disclosure of Attridge is limited to collecting light from an end 25 of waveguide 23 with optical structure 24, which, in turn, directs light to a photodetector at an end face 38 of optical structure 24. Col. 8, lines 46-56.

Claim 5 is additionally allowable since Attridge lacks any express or inherent description of an optical coupling element that comprises a diffraction grating the diffracts light *into a waveguide film* having a relatively high refractive index. Instead, the disclosure of Attridge is limited to diffraction gratings on layers 28 and 29 of relatively low refractive indices to diffract light *out of layers 28 and 29.* Col. 7, lines 55-59.

Claim 7, which depends from claim 5, is also allowable because Attridge includes no express or inherent description of a diffraction grating *between* a substrate and a waveguide film of a composite waveguide.

Withdrawal of the 35 U.S.C. § 102(b) rejections of claims 1–3, 5-7, 14-16, 19, and 21 is respectfully solicited, as is the allowance of each of these claims.

Rejections under 35 U.S.C. § 103(a)

Claims 4, 8-13, 17, 18, 20, and 22-25 stand rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Attridge in View of Attridge '784

Claims 4, 8-13, and 17 have been rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is assertedly obvious over the subject matter taught in Attridge, in view of teachings from U.S. Patent 5,344,784 to Attridge (hereinafter "Attridge '784").

Claims 4, 8-13, and 17 are each allowable, among other reasons, for depending directly or indirectly from independent claim 1, which is allowable.

Moreover, it is respectfully submitted that Attridge and Attridge '784 do not provide teachings or suggestions that support a *prima facie* case of obviousness against several of claims 4, 8-13, and 17.

For example, with respect to the subject matter recited in claim 4, neither Attridge nor Attridge '784 teaches or suggests an optical coupling element comprising a prism that focuses light into a waveguide film. Rather, the teachings of Attridge are limited to a waveguide 23 that directs light into a propagating layer 27 (*see, e.g.,* FIG. 2(a) and to a diffraction grating that diffracts light out of a layer 28, 29 of relatively low refractive index n_3 (col. 7, lines 55-59). The teachings of Attridge '784 are limited to a prism or grating that couples light *out of a waveguide* and into a sensor. Col. 5, lines 34-38.

Claim 9 is further allowable since neither Attridge nor Attridge '784 provides any teaching or suggestion of "a precise spacing layer."

Claim 12 is additionally allowable because Attridge and Attridge '784 both lack any teaching or suggestion of a precise spacing layer that has a refractive index that is less than the refractive indices of both an input waveguide and the waveguide layer of a composite waveguide.

Attridge in View of Herron

Claims 18, 20, and 22-25 are each rejected under 35 U.S.C. § 103(a) for reciting subject matter that is purportedly unpatentable over the subject matter taught in Attridge, in view of teachings from U.S. Patent 5,512,492 to Herron et al. (hereinafter "Herron").

Herron issued on April 30, 1996, from an application that was filed on May 18, 1993. A claim for priority has been made in the above-referenced application to U.S. Patent Application Serial No. 08/393,450, which was filed on February 23, 1995. As the priority date for the above-referenced application precedes the issue (and publication date) of Herron, Herron qualifies as prior art under 35 U.S.C. § 102(e).

With respect to rejections under 35 U.S.C. § 103(a) that are based upon references which qualify as prior art under 35 U.S.C. § 102(e), 35 U.S.C. § 103(c) provides:

> Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

At the time the invention disclosed in the above-referenced application and in U.S. Patent Application Serial No. 08/393,450 was made, it was owned by or subject to an obligation of assignment to the University of Utah Research Foundation, as evidenced by the assignment recorded at Reel No. 007600, Frame No. 0086. The University of Utah Research Foundation is the same party to which Herron had already been assigned, as indicated by the cover sheet of Herron.

Accordingly, Herron may not be relied upon in a rejection of any of the claims of the above-referenced application under 35 U.S.C. § 103(a).

In any event, it is respectfully submitted that each of claims 18, 20, and 22-25 is allowable, among other reasons, for depending directly or indirectly from independent claim 1, which is allowable.

It is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 4, 8-13, 17, 18, 20, and 22-25 be withdrawn, and that each of these claims be allowed.

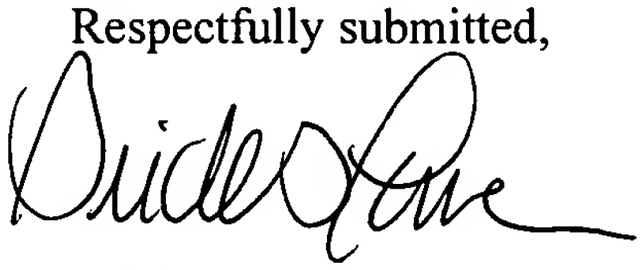
Restriction Requirement

Reconsideration and withdrawal of the restriction requirement in the above-referenced application are respectfully requested since claims of Group I and Group II are directed to substantially the same subject matter—apparatus for performing specific binding assays and, further, since the apparatus of the claims of both Group I and Group II include substantially the same elements—a composite waveguide, a light source, and a light detector.

CONCLUSION

It is respectfully submitted that each of claims 1-25 and 26-63 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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